UNITED STATES PATENT AND TRADEMARK OFFICE

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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Ex parte JIN CAO, LI ERRAN LI, HONGYU GAO, and
BRIAN D. FRIEDMAN

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Appeal 2016-002525
Application 13/688,885[1]
Technology Center 3600

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Before ALLEN R. MacDONALD, NABEEL U. KHAN, and
KARA L. SZPONDOWSKI, *Administrative Patent Judges.*

KHAN, *Administrative Patent Judge.*

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from the Final Rejection
of claims 1–18. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

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STATEMENT OF THE CASE

THE INVENTION

Appellants' invention relates to enterprise social networks and in particular "a logistic regression model to provide an indication of a relationship between a user's position within an enterprise and how the user interacts with other users of an enterprise social network." Spec. 1:29–31.

Exemplary independent claim 1 is reproduced below.

1.   A computing system, comprising:

at least one computing device including a processor configured to use a logistic regression model to provide an indication of a relationship between a user's position within an enterprise and how the user interacts with other users of an enterprise social network.

REFERENCES AND REJECTIONS

1.   Claims 1–18 stand rejected under 35 U.S.C. § 101 as directed to non-statutory subject matter. Final Act. 2.

2.   Claims 1–9 and 11–17 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Mahdian (US 2011/0055132 A1, pub. Mar. 3, 2011) and Flammer (US 2008/0091441 A1, pub. Apr. 17, 2008). Final Act. 3–5.

3.   Claims 10 and 18 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Mahdian, Flammer, and Agarwal (US 2009/0055139 A1, pub. Feb. 26, 2009). Final Act. 6.

ANALYSIS

NON-STATUTORY SUBJECT MATTER REJECTION

Analyzing the claims under the two-step framework laid out in *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2355 (2014) (*citing Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 75–78 (2012), the Examiner finds the claims are directed to patent ineligible subject matter. *See* Final Act. 7–12. Specifically, under step one of the *Alice/Mayo* framework, the Examiner finds the claims are directed to the abstract idea of "providing an indication of a relationship between a user's position within an enterprise and how the user interacts with other users of an enterprise social network." Ans. 6. The Examiner finds the claimed "indication of a relationship" is a mathematical relationship that is based on a model and thus, further supports the conclusion that the claims are directed to an abstract idea. Ans. 6–7.

Under the second step of the *Alice/Mayo* framework, the Examiner finds the claims do not "include additional elements that are sufficient to amount to significantly more than the judicial exception because a computer implemented method is merely the recitation of generic computer elements and do[es] not add significantly more to the judicial exception." Ans. 7.

Appellants argue that between the Final Rejection and the Answer, "the Examiner has changed his position regarding what the alleged abstract idea is" which, according to Appellants, is an indication that the claims do not recite an abstract idea. Reply Br. 1. Moreover, Appellants argue, the Examiner's identified abstract idea "is not anywhere close to a fundamental principle or well-known economic practice as was present in Supreme Court § 101 decisions." Reply Br. 2. Appellants further argue that "there is no

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mathematical formula that would be preempted and there is no algorithm that would be patented, itself" in the claims. Reply Br. 2.

> Addressing the second prong of the *Alice/Mayo* test, Appellants argue

> > [t]aking the claim limitations regarding the logistic regression model and the enterprise social network into account reveals that the claims are directed to a particular application for a specific purpose (i.e., to use a logistic regression model to determine a relationship between an individual's position within an enterprise, such as a corporation, and how that individual interacts with others on the enterprise's social network).

App. Br. 5. Appellants also argue that "the invention in this case is necessarily routed [sic] in computer technology" because "[a] processor is required to perform the logistic regression model and the enterprise social network is necessarily accessible by or utilized on a computer." Reply Br. 3.

> We are unpersuaded by Appellants' arguments. Turning to step one of the *Alice/Mayo* framework, we find the Examiner did not err in finding the claims are directed to a judicially recognized abstract idea. Independent claim 1 is directed to "us[ing] a logistic regression model to provide an indication of a relationship between a user's position within an enterprise and how the user interacts with other users of an enterprise social network." Independent claim 11 recites similar limitations. We agree with the Examiner that because the claimed "indication of a relationship" is provided by the logistic regression model, it is a mathematical relationship between the user's position in an enterprise and how the user interacts with others in the enterprise social network. Further, in order for the logistic regression model to provide the "indication of a relationship," the "user's position within an enterprise" and "how the user interacts with other users of an enterprise social network" must also be distilled to mathematical constructs,

such as, for example, "an enterprise organizational graph" and "a user interaction graph," respectively, as described in the Specification. *See* Spec. ¶¶ 3–6. Claims similar to the ones at issue here, directed to mathematical relationships and correlations, have been found to be directed to abstract ideas by our reviewing court. *See Digitech Image Tech. v. Electronics for Imaging, Inc.*, 758 F.3d 1344, 1350 (Fed. Cir. 2014) (finding claims directed to "a process of organizing information through mathematical correlations" as abstract); *see also Parker v. Flook*, 437 U.S. 584, 595 (1978) (noting that "'if a claim is directed essentially to a method of calculating, using a mathematical formula, even if the solution is for a specific purpose, the claimed method is nonstatutory.'"). Thus, we find no error in the Examiner's finding that the claims at issue are directed to an abstract idea.

Applying step two of the framework, we also agree with the Examiner that the claim limitations, when viewed individually and as a whole, do not transform the claim to something significantly more than an abstract idea. The recitation of a computer system, computing device, and processor in claims 1 and 11 are generic computer hardware used in their routine and conventional ways to implement the abstract idea. "It is well-settled that mere recitation of concrete, tangible components is insufficient to confer patent eligibility to an otherwise abstract idea. Rather, the components must involve more than performance of 'well-understood, routine, conventional activities previously known to the industry.'" *In re TLI Comms. LLC Patent Litigation*, 823 F.3d 607, 613 (Fed. Cir. 2016) (quoting *Alice*, 134 S. Ct. at 2359). Thus, just because "[a] processor is required to perform the logistic regression model and the enterprise social network is necessarily accessible

by or utilized on a computer," (Reply Br. 3), as Appellants argue, does not transform the claim to significantly more than the identified abstract idea.

Accordingly, we sustain the Examiner's rejection of claims 1–18 as directed to an unpatentable abstract idea.

OBVIOUSNESS REJECTION

Claim 1

The Examiner finds Mahdian teaches or suggests all the limitations of claim 1, except that Mahdian relates generally to social networks, rather than specifically to enterprise social networks. *See* Final Act. 3. The Examiner relies upon Flammer for its teachings relating to enterprises, and finds Flammer teaches or suggests "a user's position within an enterprise." Final Act. 3. By combining Mahdian with Flammer, the Examiner finds Mahdian's system can be applied to enterprise social networks. *Id.*

Appellants argue "there is no teaching [in Mahdian] of . . . 'how the user interacts with other users of an enterprise social network." App. Br. 8. Instead, according to Appellants, "the *Mahdian* reference logistic regression estimator only indicates a degree of social correlation in the set of users considered at the time t." App. Br. 8.

Mahdian relates to detecting social influence between users of a social network. Mahdian ¶ 7. Social influence between users can be detected based on the relationships and associations between the users. *Id.* The Examiner finds that social influence of users upon other users teaches or suggests "how the user interacts with other users" of a social network. Ans. 8–9. We agree with the Examiner's findings and conclusions. By tracking relationships between users, Mahdian accounts for the user's position in a social network. And because Mahdian detects social influence based on

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relationships and associations between users, we agree with the Examiner

that Mahdian teaches or suggests a relationship between the user's position

in the social network (given by the user's relationships with others) and how

the user interacts with other users of the social network (the social influence

of a user on another user based upon those relationships and associations).

Ans. 9. Hence, we are unpersuaded by Appellants' argument.

> Appellants further argue:

>> There is no reason for making the proposed combination [of Mahdian and Flammer] because a user's positon within an enterprise does not have any connection with the determinations that are being made within the Mahdian reference. The Mahdian reference is trying to determine whether there is a social correlation in a set of users and then to use that to determine a degree of social influence. Social influence and social correlation are outside of enterprise or business concerns. Therefore, an individual's positon within an enterprise or business organization does not have any usefulness in the context of the Mahdian reference.

App. Br. 9. Appellants add that the use of Flammer with Mahdian is based

on improper hindsight because the "reason for adding position information

[from Flammer] really has no relationship to the determinations made in the

Mahdian reference." App. Br. 11–12.

> We are unpersuaded by Appellants' argument. As explained above,

Mahdian relates to social networks generally and therefore teaches or

suggests a user's position within a social network, but not specifically within

an enterprise. The Examiner relies upon Flammer as teaching a user's

position within an enterprise. Final Act. 3. An enterprise social network is

one type of social network. Thus, we agree with the Examiner's finding that

Mahdian's general teachings can apply to the specific case of an enterprise

social network. Further, the Examiner has articulated a reason with rational

underpinning explaining why Mahdian's system would apply in the context
of an enterprise. In particular, the Examiner finds "[t]he influence
determinations of Mahdian are directly applicable to an enterprise and user's
position within an enterprise such that, for example, a CEO of a company
would have more influence over a clerk in the accounting department." Ans.
9. "It would have been obvious to one of ordinary skill in the art to utilize a
user's position in an enterprise network, as taught by Flammer, in Mahdian's
system of identification and measurement of social influence and correlation
with reasonable expectation that this would result in a system that allows for
the quantification of user's interactions in an enterprise network." Ans. 9–
10.

Accordingly, we sustain the Examiner's rejection, of claim 1 under
§ 103. We also sustain the Examiner's rejection of claims 2–9 and 11–17,
which were argued together with claim 1.

Claims 10 and 18

Claims 10 and 18 depend from independent claims 1 and 11
respectively, and add that the logistic regression model be expressed as a
specific mathematical formula described in equation 3 of the Specification.
The Examiner finds Agarwal teaches or suggests using a "logistic regression
model" that corresponds to the recited equation in claims 10 and 18. Final
Act. 6 (citing Agarwal ¶¶ 33, 34, 36, 41, 42, Table 2.1).

Appellants argue "there is no reason for adding a logistic regression
model of the type suggested by the Examiner on page 6 of the Office Action
to the modified version of the *Mahdian* reference." App. Br. 13. "The
logistic regression model that the Examiner attempts to extract from the

Agarwal reference to insert into the *Mahdian* reference does not appear to have any ability to provide the estimate that the logistic regression estimator of the *Mahdian* reference provides." App. Br. 12–13. "The Examiner's alleged motivation in paragraph 37 of the Office Action does not provide any explanation for how the information the Examiner takes from the *Agarwal* reference would provide such a result." App. Br. 13.

The Examiner responds that

> the Agarwal reference teaches the use of a Bernoulli exponential family which is the logistical model for the Bernoulli distribution and is synonymous for logistic regressions. The Examiner notes that this is an old and well known concept in the statistical art. The Bernoulli distribution is a conditional distribution and the logistic distribution function (of a Bernoulli distribution) represents the probability of particular outcomes. Therefore, utilizing the Bernoulli distribution, as taught by Agarwal, in Mahdian's system would yield predictable results as Mahdian is determining influence and correlations i.e. the strengths of users who would act similarly in the social network or, the probability that if one user performs an action, how likely other users who are closely correlated are to performing the same action. Both Agarwal and Mahdian are using statistics to predict or determine how likely an event will occur based on previous conditions.

Ans. 10–11.

We are unpersuaded by Appellants' arguments and agree with the Examiner's findings and conclusions as set forth above. Mahdian teaches the use of a regression logistic estimator in determining social correlation. Mahdian ¶ 10. Agarwal teaches the use of a Bernoulli exponential family for logistic regression. *See* Agarwal ¶¶ 32–33, Table 2.2. The use of the Bernoulli exponential family leads to an expression similar to that recited in claims 10 and 18. We agree with the Examiner that combining Agarwal's Bernoulli distribution in Mahdian's system would yield predictable results in

determining social influence. Further, we also agree with the Examiner that the use of Bernoulli distribution in logistical regression is a well-known concept. Indeed, such a conclusion is supported by Appellants' own Specification which describes that the invention's computing device "models the dependency of" the claimed variables "using at least one *well-known logistic regression model*, several of which are available from statistical literature, using the" relationship described by the claimed equation. Spec. 4, ll. 13–14 (emphasis added).

Accordingly, we sustain the Examiner's rejection of claims 10 and 18.

DECISION

The Examiner's rejection of claims 1–18, under 35 U.S.C. § 101, is affirmed.

The Examiner's rejection of claims 1–18, under 35 U.S.C. § 103(a), is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 41.50(f).

AFFIRMED